

# 2<sup>nd</sup> COOK & Health Scientific Symposium

## Proceedings



Organised by  
BCC INNOVATION - Research and Innovation Center  
and  
University of West London

London, UK  
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The 2nd COOK & Health Scientific Symposium is an event whose objective is to share up-to-date knowledge on the relationships between cooking, eating behaviours and health.

Speakers coming from a wide range of countries and various disciplines presented their work and knowledge on this topic. Amongst the questions that have been discussed:

- Definition of cooking / cooking skills
- Trends in cooking
- Cooking skills transition
- How effective are cooking skill interventions changing behaviours?
- Cooking policies
- Experimental research in cooking interventions
- The role of cooking in the meal preparation process
- Cooking methods and effects on nutritional properties / human health



# Program

**9:00 - 9:30** Registration

**9:30**

*Welcome and Introduction speeches*

Elena Urdaneta, Research Director BCC INNOVATION, Basque Culinary Center

Janet Rowson, Deputy Dean and Head of hospitality and Food Studies, The London Geller college of Hospitality and Tourism, University West London

**9:45**

**Impact of a French food education programme on consumption of vegetables by children**

Mohamed Merdji, France

**10:20**

**Home cooking practices, experiences and perceptions: qualitative interviews using photo-elicitation**

Susanna Mills, UK

**10:55** *Coffee Break & POSTER Session*

**11:30**

**Oral communications – Session 1**

**11:30 The Development of Kitchen Technology and Food Preparation in the English Country House 1315 – 1865**

Nancy Scanlon; USA (Florida International University)

**11:45 Influence of food preparation behaviours on 5-year weight gain and obesity risk in French adults**

Caroline Méjean, Wendy Si Hassen, Aurélie Lampuré, Séverine Gojard, Pauline Ducrot, Sandrine Péneau, Serge Hercberg, Katia Castetbon; France (Université Paris 13, INRA)

**12:00 Culinary workshops and shared meals against undernutrition and social isolation: the cases of two retiree's associations in Lyon**

Sonia Bouima, Maxime Michaux, Séverine Gojard; France (Institut Paul Bocuse)

**12:15 "Facecook", design and roll-out of a community based social network to promote healthy eating practices amongst low income population**

Jacques Bibai, Nicolas Darcel, Manon Dugré, Julien Ollivier, Faustine Regnier, Manon Robin; France (INRA, AgroParisTech, Université Paris-Saclay)

**12:30**

**A Gastrophysics approach to healthier eating habits**

Jozef Youssef, UK

**13:05** *Buffet Lunch in Pillars Restaurant & POSTER Session*

**15:00**

**Oral communications – Session 2**

**15:00 Kids in the Kitchen: Mothers' perceptions of Mess and Mayhem**

Fiona Lavelle & Moira Dean; *UK* (Queens University Belfast)

**15:15 New tools to promote vegetable consumption of college students: Participatory food development and sensory-based activities for adolescents**

Anu Hopia, Susanna Ihanus, Mari Sandell; *Finland* (University of Turku)

**15:30 Reimagining Nutrition Education in a Teaching Kitchen**, Kate Shafto, Jenny Breen, Dominic Decker; *USA* (University of Minnesota)

**15:45**

**Foodservice with a side of responsibility: the challenges of implementing Corporate Social Responsibility in the hospitality sector**

Peter Cross, *UK*

**16:20**

***Round Table: What should be the future of cooking research?***

Leslie Cunningham-Sabo (*USA*); Julia Wolfson (*USA*); Klazine van der Horst (*Switzerland*); Ana Costa (*Portugal*); Martin Caraher (*UK*)

**17:05**

*Conclusion*

***17:15 End of the Symposium***

## Abstracts

### Invited speakers



#### Mohamed Merdji (France)

Mohamed Merdji is professor of Marketing at Audencia Business School in Nantes (France). He holds a PhD in Management Sciences from University of Paris IX Dauphine and a PhD in Economics Sciences from University of Lille. His research interests are education methods and evolution of taste in foods, food risk perception and new trends of food marketing. He is the coordinator of EducAlim, a research-action project realized in 17 schools in France, which objective is to promote healthy eating through cooking education.

#### **Impact of a French food education programme on consumption of vegetables by children**

Policies being implemented over recent years to fight against the rise of overweight and obesity among children are mainly based on nutritional approaches. These approaches, while needed, must however not disguise the role of the environment. Dietary patterns of children are indeed first shaped by their social, family and cultural environment. There are therefore favourable and unfavourable environments. And when the environment is unfavourable, it is important to know on which levers we can act to correct its effects. The EducAlim programme shows that the school and the school canteen may have a very positive role in this area. This programme was funded by the French Ministry of food and was established in order to promote the consumption of vegetables among children. It was led by four researchers: Mohamed Merdji (Audencia Nantes), Claude Fischler (CNRS / EHESS), Nathalie Rigal (University Paris-X) and Philippe Courcoux (ONIRIS). EducAlim was based on three types of activities, food learning, food gardening and food cooking which has been implemented in twenty French primary schools during three years. The impact has been analysed by a repeated measures analysis of the consumption of vegetables within two groups (intervention and control). The results show that the programme was effective in increasing vegetable consumption in the intervention group.



### Susanna Mills (UK)

Susanna Mills is a final year doctoral student at the Institute of Health & Society, Newcastle University, UK. In her thesis, Susanna is using mixed methods to explore the health and social determinants and outcomes of home food preparation. This includes developing an improved understanding of the nuanced terminology and behaviours associated with cooking, and investigating cooking's potential as a tool to create positive health and social impacts. Susanna is a public health doctor by background, and is also interested more generally in strategies to ameliorate the prevalence of diet related diseases such as obesity and type II diabetes, at a local, national and global level.

## **Home cooking practices, experiences and perceptions: qualitative interviews using photo-elicitation**

Food-related choices have an important impact on health, and the cooking of food at home plays an important role in everyday life. Food preparation methods may be linked to diet and health benefits. However, evidence is currently lacking regarding people's choices and experiences associated with food preparation, and the nuanced perceptions and practices regarding different types of cooking food at home have been under-researched. Previous qualitative studies have often been limited in terms of participant socio-demographics and research perspective. We aimed to study home food preparation practices, experiences and perceptions amongst adults in the United Kingdom (UK). We also aimed to examine the specific concept of 'home cooking', through comparison with qualitative cooking research from the United States (US), and to discuss implications for health, and public health policy.

A matrix was used to purposively sample participants from the North East of the UK with diverse socio-demographic characteristics. Participants developed photographic food diaries that were used as prompts during semi-structured interviews, and data were analysed using the Framework Method. Cross-country comparison was undertaken with the participants of focus groups held in Baltimore, Maryland, US, and data were combined and analysed using the Framework approach.

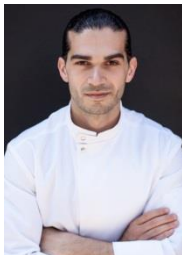
Interviews were conducted with 18 UK adults (five men and 13 women), aged approximately 20 to 80 years, to reach data saturation. Participants' practices varied widely, from reliance on pre-prepared foods, to preparing complex meals entirely from basic ingredients. Key themes emerged regarding the cook (identity), the task (process of cooking), and the context (situational drivers). Resources, in terms of time, money and facilities, were also underpinning influences on food preparation. Participants' practices were determined by both personal motivations to cook, and the influence of others, and generally reflected compromises between varied competing demands and challenges in life. Most people appeared to be overall content with their food preparation behaviour, though ideally aspired to cook more frequently, using basic ingredients. This often seemed to be driven by social desirability. Comparison with 53 US focus group participants (14 men and 39 women) showed that participants in both countries distinguished 'home cooking' as a subtype distinct from other



forms of cooking at home. 'Home cooking' was defined in terms of: preparing a meal from scratch; cooking with love and care; and nostalgia. These descriptions of 'home cooking' were not aligned closely with principles of healthy eating.

Home food preparation is complex, with heterogeneous practices, experiences and perceptions both between individuals and within the same individual over time, according to shifting priorities and circumstances. Focussing interventions on life transition points at which priorities and circumstances change, with careful targeting to stimulate personal motivation and social norms, may prove effective in encouraging home food preparation.

Cooking at home has a range of dimensions, with different roles in health, and terminology should be clearly defined in research studies. 'Home cooking' should be clearly distinguished from other types of cooking at home, and public health messages emphasising the potential for cooking at home to improve diet and health require clearer definitions, given the divergence between perceptions of 'home cooking' and recommendations for a healthy diet. Cooking at home is unlikely to independently resolve the international growing burden of dietary-related diseases, but this issue cannot be tackled without consideration for the complexity of cooking perceptions and practices.



[Jozef Youssef \(UK\)](#)

Kitchen Theory's founding chef, Jozef Youssef began his journey on the path towards finding a greater purpose for his culinary craft in 2011 when he attended a seminar entitled 'Multi-Sensory Flavour Perception'. Since this time his research into gastronomy from a sensory and psychophysics perspective has become a central part of Kitchen Theory's philosophy and approach towards designing dining experiences. Over the past couple of years the Kitchen Theory team have been working with Oxford University's Cross modal laboratory in the hope of better understanding how the brain interprets and perceives flavour using all five senses. A part of the interest in this field of research stems from a desire to understand our relationship with food and how this understanding may hold some of the keys to encouraging people towards healthier and more sustainable eating and cooking.

## **A Gastrophysics approach to healthier eating habits**

Many theories are now emerging on how we can achieve a balanced diet and encourage people to eat more sustainably, among the fields to contribute towards this effort is the science of 'gastrophysics'. Gastrophysics is the combination of gastronomy and psychophysics – gastronomy being 'the knowledge and understanding of all that relates to man as he eats' (Brillat Savarin), and psychophysics being the branch of psychology that deals with the relations between physical stimuli and mental phenomena. It brings together chefs and psychologists with an interest in how the human brain interprets and appreciates flavour based on sensory perceptions and associations with food.

When looking at the current dietary trends, most chefs will find very little to agree with when it comes to the guidance and advice given. This is partly because research mostly shows that fad diets have short-lived results at best, and anyone following them often ends up frustrated by the restrictions or impracticalities. Families looking for ways to cut down their calorie intake may also find it difficult to find solutions that meet the nutritional requirements of all their family members. There are also a number of other reasons as to why many developed countries are suffering from a dietary/nutritional crisis (diabetes, obesity, heart disease and so on), these include; mass availability of highly processed foods and low nutrition content in ingredients farmed using intensive methods, lack of cooking know how, modern lifestyle (from changes in family dynamic and other social changes), and a reduction in the sensory contact and subsequent stimulation with the foods that are consumed (on account of changes in how we source our food, cook it and consume it - distractions such as our mobile phones and TVs have distracted us from mindfulness towards appreciating our food).

As ‘gastrophysicists’ we believe our research towards looking at cross modal interactions in the brain, can assist in understanding how humans perceive colour, shape, texture, sound etc. in relation to taste and flavour – and how this relates back to satiety, our relationship with food and ultimately what food choices we make.

We know from research that particular colours, shapes and sounds are consistently matched with particular tastes and flavours, we know that the weight of cutlery can affect one’s perception of a meal (and how much they would pay for it). Some research has suggested that smell can account for up to 90% of what we perceive as flavour, which has massive implications regarding how we can enhance people’s perceptions of a meal. We know that handing someone a piece of silk as they drink a glass of wine can augment the drinker’s perception of texture allowing for a ‘smoother’ mouthfeel.

The above are just a few examples of how human beings are sensory beings, and given that eating is considered among the most multisensory of all our daily activities, surely a firm understanding of our relationship with food from this perspective can only serve to benefit and contribute towards the food security and sustainability issues the world faces in the years to come.



### [Peter Cross \(UK\)](#)

Peter Cross has a professional background in food and nutrition, with 20 years’ experience working in foodservice before joining the University of West London as a full-time Lecturer. He is currently a course leader for the BSc (Hons) in Culinary Arts Management; subject areas include: culinary arts, gastronomy, applied nutrition and responsible supply chain management. His PhD thesis, in progress, is entitled “Responsible Foodservice Value Chain Management”, it addresses the various audit methodologies, metrics and practices used by foodservice businesses to monitor responsibility.



## Foodservice with a side of responsibility: the challenges of implementing Corporate Social Responsibility in the hospitality sector

Price and quality are the most important areas for food businesses and their customers' (DEFRA, 2015). However, media coverage of food issues, such as the Tesco's Horsemeat scandal, is forcing food businesses to look closer at the responsible management of their supply chains. It is now becoming increasingly important for restaurants, hotels and contract caterers to demonstrate responsible practices across the supply chain (Maloni and Brown, 2006; Porter & Kramer, 2006; Steger, Ionescu-Somers and Salzmänn, 2007). Many larger businesses convey good practice through annual Corporate Social Responsibility (CSR) reports focusing on areas of such as: food traceability, healthy eating, food allergies, food waste etc..., thus potentially improving their foodservice practices in these areas.

However, smaller companies, which make up 94% of the food business sector (DEFRA, 2015), must rely on third party accreditation at an extra cost, thus discouraging their participation in the reporting of responsible practices. There are numerous third party initiatives and the established certifications mainly focusing on one stage or area of the supply chain i.e., organic, fair-trade, calories displayed on the menu, scores on the doors, etc... Many researchers have found that the standard model of CSR (Society, Environment, and Economic) cannot be applied to food businesses (Forsman-Hugg et al, 2013; Maloni and Brown, 2006). Forsman-Hugg et al, (2013) conducted a number of stakeholder workshops with food business owners which found additional areas that need to be addressed when applying CSR to food, such as: local market presence, nutrition, product safety and animal welfare. The study looked at applying CSR to the entire supply chain, which requires collaboration from many parties and was found to be complex and time consuming (Forsman-Hugg et al, 2013).

It can be argued that applying CSR to the 'cooking and serving' link in the food supply chain will have the most impact, as it is the chef who orders the food from the suppliers and writes the menus for the customers. More investment and research should be placed into the development of a recognised holistic framework not more individual certifications with focus on the 'cooking and serving' link within the foodservice operation. Personalised frameworks should be tailored to the many different styles of foodservice operation with focus on critical control points, key performance indicators and metrics to enable the monitoring of "responsible business performance".

*DEFRA (2015) A Plan for Public procurement: food and catering: The Balanced Score Card. [online] Available at: <https://www.gov.uk/government/publications/a-plan-for-public-procurement-food-and-catering-the-balanced-scorecard> (accessed February 2014)*

*Forsman-Hugg, S. Katajajuuri, JM. Riipi, I., Mäkelä, J., Järvelä, K. and Timonen, P. (2013) Key CSR dimensions for the food chain. British Food Journal. 115(1) pp. 30–46*

*Maloni, M. J. and Brown, M. E. (2006). Corporate Social Responsibility in the Supply Chain: An Application in the Food Industry. Journal of Business Ethics, 68 (1), pp. 35 – 52*

*Porter, M.E. and Kramer, M.R. (2006) Strategy and society: The link between competitive advantage and corporate social responsibility. Harvard Business Review. 84 (12) pp. 78-92*

*Steger, U., Ionescu-Somers, A., and Salzmänn O. (2007) The economic foundations of corporate sustainability. Corporate Governance, 7(2) pp.162–177*

## Oral communications

### **The Development of Kitchen Technology and Food Preparation in the English Country House 1315 – 1865**

Nancy Scanlon; USA (Florida International University)

The purpose of this paper is to identify, over a 500 year period of English history, the architectural development of the kitchen in the English country house and the impact of changes in cooking technology on the food ways of each period. Seven periods of architectural design are represented in the following order: Medieval; Bodium Castle, 1365 and Knole House, 1456. Elizabethan; Hardwick Hall, 1570. Restoration; Belton House, 1684. Palladian; Holkham Hall, 1734. Neo-Classical; Kedelston Hall, 1763. Gothic; Ashridge, 1808-1817. Picturesque; Cragside House, 1864-1870. Reviews of each house include changes in the placement of the kitchen and kitchen technology, resulting impacts on food ways and menus and the reflections of social change occurring in each period. The methodology for this research is a quantitative analysis of key impacts of architectural design and cooking technology on the type of cooking technique applied during each period. Impacts include location of food preparation areas; cooking technologies, food sources and menus. The analysis for this study is based on research on the history of each house and aligned period. On-site visits to each of the houses and interviews with curators and researchers specific to the topic have identified further historical information and social impacts. Research at the John Rylands University Library, University of Manchester's to access the original 'The Forme of Cury', 1390 written by the master cooks of King Richard II, is the foundation of the research on cooking techniques and food ways. The ongoing research for this study indicates that the cooking technology and food products available for food preparation defined the cooking techniques that could be used for food preparation. The introduction of the cast iron stove made a lasting change on kitchen technology, food preparation and the placement of the kitchen in the architectural design of the house, reflecting on-going social changes in England.

### **Influence of food preparation behaviours on 5-year weight gain and obesity risk in French adults**

Caroline Méjean, Wendy Si Hassen, Aurélie Lampuré, Séverine Gojard, Pauline Ducrot, Sandrine Péneau, Serge Hercberg, Katia Castetbon; France (Université Paris 13, INRA)

Frequent consumption of commercially-prepared meals appears to be associated with obesity. Such a relationship could also be observed between home cooking practices and obesity but it has not been documented so far. We investigated the prospective association between food preparation behaviours and 5-year weight gain and the onset of obesity after 5 years in adults. We prospectively examine 5-year weight gain and the risk of obesity after 5 years in 3,629 men and 9,221 women aged  $\geq 18$  years participating in the NutriNet-Santé cohort study. Self-reported weight, height and cooking practices were collected at baseline and 5 years later. Food preparation behaviours were assessed at baseline using a web-based questionnaire. Cooking skills, preparation from scratch, i.e. use of raw or fresh ingredients that had no or

minimal processing and kitchen equipment were assessed using a 0-10-point score and, frequency of meal preparation, enjoyment of cooking and willingness to cook better or more frequently were categorical variables. Associations between various dimensions of food preparation behaviours and 5 years weight gain and risk to be obese 5 years later were respectively assessed using analysis of covariance and logistic regression models stratified by sex and adjusted for age, household composition and socio-economic factors. In both genders, associations of frequency of meal preparation, enjoyment of cooking and willingness to cook better or more frequently, cooking skills and kitchen equipment with 5-year weight gain or obesity risk were not statistically significant ( $P>0.05$ ). In women, score of preparation from scratch was inversely associated with risk to be obese five years later ( $OR=0.92$  (0.86; 0.98),  $P=0.03$ ) and women with low score of preparation from scratch more gained weight over 5 years (mean weight gain=1.69 (0.14)) compared with those with the highest score (mean weight gain=0.87 (0.11),  $P=0.04$ ). Use of raw or fresh ingredients that had no or minimal processing was related to lower risks of obesity and weight gain in women. Such complex relationships should be taken into account to effectively target public health efforts in obesity prevention.

**Culinary workshops and shared meals against undernutrition and social isolation: the cases of two retiree's associations in Lyon**

Sonia Bouima, Maxime Michaux, Séverine Gojard; *France* (Institut Paul Bocuse)

In a society with an ageing population, concern for the quality of life and health of elderly people is a major issue. We now know that eating is a key factor for “successful ageing”. Beyond its nutritional dimension, food is a source of pleasure and social interaction. Emerging public policy and practice recognizes this, as in the example of culinary workshops and shared meals, which aim to prevent undernutrition, and also to fight social isolation by recreating social links. The purpose of this research is to understand the individual experience of retired people who participate in these actions, and particularly the practices and representations of food that are mobilized and the kinds of relationship that develop. This sociological research focuses on two retiree's associations in the center of Lyon. This is a comparative study using an ethnographic approach that includes participant observations during the culinary workshops and shared meals, and semi-structured interviews. In association A, the culinary workshop and shared meal appear to take an informal form. The participants supervise all the activities themselves (bottom-up approach). The meal takes place as at home, in a convivial mode, including high consumption of alcohol and rich dishes. The roles are defined tacitly but the meal is the opportunity for some members to exercise their authority. In association B, activities are supervised by external actors (a nutritionist and a cook). The focus is mainly on health and food safety and knowledge transmission is top-down. Participation is encouraged but is limited and regulated. The meals in these retiree's associations show that the social link is more complex than pleasure and conviviality only. In fact, the meal is a time of stratified sociability (eating together but among peers only) but also a time for socialization, through which each person's role is defined.

**“Facecook”, design and roll-out of a community based social network to promote healthy eating practices amongst low income population**

Jacques Bibai, Nicolas Darcel, Manon Dugré, Julien Ollivier, Faustine Regnier, Manon Robin;  
France (INRA, AgroParisTech, Université Paris-Saclay)

Social inequalities in health are primarily due to the difficulty to maintain a balanced diet on a constraint budget. Moreover, low income population are less likely to be receptive to nutritional recommendations. Populations with a small food budget could considerably benefit from selecting foods with good nutritional quality for their price. Current nutrition promotion campaigns based on nutrient frequency advices remain insufficiently efficient in these populations. One of the proposed reasons is the gap between actual food practices, where the social link and culinary acts are priming, and the theoretical aspect of these nutrition promotion campaigns. We have developed and deployed “Facecook”: a smartphone based social network combined with food logistics and cooking tips as well as nutritional advices and online quizzes aiming at creating small communities sharing recipes, participants’ feedbacks, culinary know-how and knowledge in nutrition. The smartphone app was implemented in a disadvantaged neighborhood of Trappes, (Paris region, France) with the active participation of the local social emergency associations. It was designed jointly with members of the community: beneficiaries of the social emergency services and members of local social emergency associations. Once “Facecook” was available, 27 subjects, living in the neighborhood tested the app for a period of 6 month. Connections to the app and usages (such as viewed recipes, quizzes taken, shares and likes) were collected by the software, and in-depth interviews realized among users (uses and perceptions, in relation to their interest for cooking, cooking skills, socio-economic constraints and social integration). The results from this test period are presented and discussed, especially regarding the individual and socio-demographic profiles of users of “Facecook” with respect to their usage of the social network. Lessons from this intervention allow to identify brakes and possible levers to improve nutrition promotion and awareness in deprived areas, in a time of social crisis.

*This work was supported by the regional council of Paris Île-de-France, and received financial support from Ferrero. We are very grateful to the "Point Services aux Personnes" (PSP) of Saint Quentin en Yvelines, and especially to Safyatou, for their implication and their help throughout the research.*

**Kids in the Kitchen: Mothers’ perceptions of Mess and Mayhem**

Fiona Lavelle & Moira Dean; UK (Queens University Belfast)

Recent research shows that the mother remains as the primary source of learning cooking skills. Additionally, learning at a younger age has been associated with skill maintenance, cooking confidence and a better diet quality. However, it has been suggested that domestic cooks are no longer able to prepare meals in their entirety and rely more on processed convenience food and will no longer be able to pass on the necessary skills to prepare a meal. The aim of this study was to understand mother’s perceptions of children in the kitchen and cooking. Nine focus groups were undertaken with young mothers (20 – 39 years old) from Northern/Republic of Ireland, after they took part in a cooking experiment aiming to increase intention to cook from scratch. All transcripts were transcribed verbatim and analysed using a

deductive Thematic analysis using Nvivo. Preliminary results show that mothers find that children, “little tigers,” are in their way in the kitchen and that they make it difficult for mother’s to prepare meals, “I have 2 kids running about pulling me grabbing me mummy, mummy, mummy, ... babies looking fed and it’s just madness.” Mothers will also cater to their child’s foods preferences, so much so that they will cook multiple dinners to cope with ‘fussy eaters.’ While Mother’s have a desire for children to learn how to cook, they tend to do more recreational baking activities rather than fundamental basics. In addition Mothers have safety concerns about children in the kitchen, although acknowledging that they themselves were in the kitchen at young ages helping their mothers or indeed taking over the role of meal preparer in some instances. It appears that the culture of children in the kitchen has vastly changed, and opportunities for children to learn basic skills are not present in this current culture. A greater awareness of age related skills and tasks for children in the kitchen should be promoted.

**New tools to promote vegetable consumption of college students: Participatory food development and sensory-based activities for adolescents**

Anu Hopia, Susanna Ihanus, Mari Sandell; *Finland* (University of Turku)

Diet rich in fruits and vegetables is associated with a decreased risk for many chronic diseases such as cardiovascular disease and type 2 diabetes. WHO recommends eating  $\geq 400$  g per day of fruits and vegetables, not including potatoes and other starchy tubers. In Finland the national recommendations for vegetable, fruit and berry (VFB) consumption is 5 portions per day. The aim of this 3-year study is to promote VFB consumption to adolescents in three different approaches: health education, sensory-based and participatory food development workshops. The objective is to motivate young people to eat more VFB, provide information about healthy diet and activate them to take part of planning and preparing food based on they own preferences. The current study sample consists of 233 freshman students in four different colleges in Finland whose average age is 17 (between 16-31y). Participants’ knowledge and attitudes toward VFB, their own estimate of consumption and food neophobia scale are studied by questionnaires before and after each intervention. The results indicate that adolescents consume VFB less than recommended in Finland. 50 % of study participants consumed only 1-2 portions FVB per day. The results also indicate that during school meals the hot vegetables are commonly disliked and discarded. The two novel promotion (sensory-based and food development) activities have been designed using service design methods. In the food development workshop students choose 3-4 dishes to develop by using more vegetable protein based new products. Some students participated in guided sensory-based activities and created also a tailored salad dish from the ingredients provided. The aim was to focus on taste, colors, texture, shapes of salad components via personal perception. The developed tools are shown to increase interest in VFB among adolescents.

*NuHeViMa-project (2015-2017) is funded by Ministry of Agriculture and Forestry.*

## **Reimagining Nutrition Education in a Teaching Kitchen**

Kate Shafto, Jenny Breen, Dominic Decker; *USA* (University of Minnesota)

Medical school nutrition education averages 20 hours over four years. This leaves future doctors ill-prepared to care for patients whose health and disease are impacted every day by what they eat. “Food Matters for Doctors,” a cooking skills class for medical students, was created in response to this alarming discrepancy. We hypothesized that teaching medical students about food, cooking and its relationship to health and disease would translate into improved self- and patient care. Our objectives were to identify the foundational principles of a healthy diet, learn to cook whole foods recipes, acquire skills for having meaningful discussions with patients about food and foster community and professional relationships through experiential learning. The class consisted of six three-hour sessions in a teaching kitchen during which medical students learned culinary skills, prepared meals aimed at the prevention and management of chronic disease and practiced mindful eating. Each session included a current literature review and discussion of food-based nutrition concepts. Anonymous pre- and post-course surveys were conducted to assess knowledge, confidence and attitudes around the objectives. Five competencies increased by >2.0 on a 1-5 Likert-type scale: (1) examine and measure gut health, (2) guide patients through dietary changes, (3) discuss dietary modifications in chronic disease, (4) connect with peers/community around food and (5) explain a whole foods diet. Qualitative analysis revealed that the course provided tools for having conversations about food with patients, situated food in a cultural, social and emotional context and emphasized a lifestyle of wellness. Nutrition education in medical school falls tragically short in addressing the proliferation of lifestyle-related diseases. Medical students need practical culinary skills to address these diseases in their patients and enhance their own wellbeing. In six cooking sessions, we demonstrate a significant impact on students’ personal behaviours in the kitchen as well as their confidence in addressing diet-related approaches to chronic disease.



## Posters

### **(1) Cook-In-Pack: A culinary innovative solution for tasty, nutritious, convenient, ready to eat and clean label meals**

Amira Kassis, Gaëlle Schlup-Ollivier; *Suisse* (Nestlé Research Center)

In the context of the Solar Impulse project, Nestle Research was implicated to develop ready to eat meals that are nutritionally adapted, tasty, convenient, and shelf stable for a period of 3 months at room temperature, while maintaining a clean label and preserving good taste and texture properties to meet the individual needs of the Solar Impulse pilots during the round the world mission. The hardship of the Solar Impulse mission does not only lie in the technical feasibility of the flight itself but also in the challenges the pilots face flying repeatedly for up to 5 days and 5 nights alone in a non- pressurized cockpit with no thermal regulation. In these conditions, food plays a very important role in sustaining the pilots thus contributing to their success. For such an innovative project, Nestle Research developed an innovative solution. Our expertise in human metabolism, nutrition, packaging and culinary art and techniques was put to the test in our collaboration with Solar Impulse. Concerns such quality and safety, convenience and reward were at the top of the list to provide all natural (no preservatives) meals adapted to the conditions of the flight around the world. In order to fulfil strict nutritional and culinary requirements for all proposed meals, the Nestle Research experimental kitchen developed the cook-in-pack process, allowing to preserve the food's taste, texture and nutrition properties whilst having a shelf life of 3 months without adding any preservatives. A sterilization process with specific temperature and pressure was applied on individually portioned pouches containing selected raw ingredients. We expect this new approach to respond to consumers' needs by offering a flavourful meal without compromising on the texture and freshness of ingredients used, or their nutritional benefits, as the preservation of vitamins was seen to be greater than in other sterilizing methods.

### **(2) Effects of context on liking and consumers' choice: A review of the different methodological approaches.**

Adriana Galiñanes Plaza, Laure Saulais, Julien Delarue; *France* (Institut Paul Bocuse)

The lack of ecological validity on consumers' tests directly affects the reliability and accuracy of the data obtained in experimental conditions and indirectly the success of a food product on the market. During the last decades, vast research has been carried out on the effects of context on consumers' behaviours in order to understand what influences consumers' decisions. However it is still unclear which variables affect the data collected and why these data cannot be transferable from one context to another. A literature review was conducted in the fields of sensory and consumer science along with experimental economics in order to analyse which were the so called contextual variables and assess the studies focused on the effects of context on consumers' behaviours. Moreover, the recent methodologies applied on consumers' tests such as the evoked contexts and/or the immersive contexts were also reviewed. So far, most of the studies emphasised the effects of environmental variables

(physical location, social facilitation...) and food extrinsic variables (e.g. presentation) on consumers' behaviours; however, no interaction between consumers' food sensitivity to different preparation methods and contexts was addressed. Therefore, as little is known about the relation between those factors, further research is needed to understand the influence of food preparation-context appropriateness and consumers' behaviours.

*"Funding for this project was provided by the Société Scientifique d'Hygiène Alimentaire (SSHA)."*

### **(3) Leveraging personal norm to promote home cooking**

Ana Isabel de Almeida Costa; Portugal (Católica Lisbon School of Business & Economics)

Objectives: Poor diets and obesity are often associated to high consumption of away-from-home foods. Yet, little is known about how to motivate people to cook more regularly. I explored the role of Personal Norm (PN) in self-regulating home cooking. Methods: Study 1) Nationally representative, postal survey of Dutch households (482 adult meal preparers, 77% female, mean age 43). Meal preparation/consumption habits were assessed. Awareness of Benefits(AB), Self-Accountability(SA), Chronic PN (PNChr), Social Norm(SN), Affect and Habit regarding the preparation of Home Cooked Meals(HMC) were measured using psychometric scales. Study 2) Lab experiment (162 adults, 77% regular home cooks, 52% female, 71% Portuguese, mean age 23). SA, SN and Affect were assessed. PN was activated by exposing participants to information about benefits of HCM (high vs. low AB). PN activation (PNAct) was subsequently measured with a psychometric scale. Study 3) Lab experiment (65 adults, 62% regular home cooks, 34% female, 82% Portuguese, mean age 23). Meal preparation/consumption habits and SA were assessed. Participants completed a Scrambled Sentence Test (PN prime vs. control). Personal obligation to prepare HCM (PNPrm) was subsequently measured. Participants finally evaluated information about benefits of HCM (high AB). Results: Study 1) Best fitting model independently regressed PNChr, Affect and Habit on frequency of preparing HCM ( $R^2=0.25$ ;  $F(3,478)=53.84$ ,  $p<.001$ ), with PNChr making the highest contribution ( $\beta=0.34$ ;  $t=7.54$ ,  $p<.001$ ) and fully mediating the effect of AB (but not SA) [Sobel  $t(2, 479)=4.88$ ,  $p<.001$ ;  $R^2=0.20$ ;  $F(2, 479)=61.29$ ,  $p<.001$ ]. Study 2) PNAct was higher in the high AB condition [ $3.5\pm1.9$  vs.  $2.6\pm1.6$ ;  $F(1,160)=10.244$ ,  $p<.001$ ], while SA, SN and Affect did not co-vary. Study 3) PNPrm was higher in primed participants [ $3.2\pm1.2$  vs.  $2.7\pm1.1$ ;  $F(1,63)=3.506$ ,  $p<.10$ ]. A general linear model with treatment as factor and PNPrm as co-variate [ $F(2, 62)=4.969$ ,  $p<.05$ ] positively associated these variables with evaluations of information about the health benefits of HCM ( $p<.1$  and  $p<.05$ , respectively). Conclusions: PN motivates people to prepare HCM more often and increases affect for messages about their health benefits. Policies designed to leverage these self-regulatory effects may be effective in promoting healthier diets.

### **(4) Little Cooking, a serious game to promote cooking pulses**

Anne-Claire Boisseau, Olga Davidenko, Gilles Fromentin, Daniel Tomé, Julien Ollivier, Jacques Bibai, Nicolas Darcel ; France (INRA, AgroParisTech, Université Paris-Saclay)

Despite their nutritional properties, pulses are today a minor contributor to French diet. This is partly due to a lack of familiarity with cooking techniques such as soaking, potentially

perceived as complex. Our team developed Little Cooking: a smartphone puzzle game in which the aim is to guess virtual recipes by combining ingredients, kitchen utensils and cookware. A total 69 recipes were proposed to the player, 20 of them included pulses as ingredients. We investigated how our game could change the perception of complexity associated with pulses. We recruited 10 subjects (age:  $23.1 \pm 3.6$ y (20 to 32y), BMI  $22.5 \pm 1.7$ kg/m<sup>2</sup> (20.7 à 25.4kg/m<sup>2</sup>), mean $\pm$ SD; 8 women) who were told to play Little Cooking for three weeks. Data relative to the game use were collected by the application. Before and after the intervention, subjects completed an implicit association test (IAT) associating pulses with either complexity or simplicity. Subjects also were interviewed on their cooking practices, pulse consumption and their impression on the game. In average, subjects played the game for  $181 \pm 83$ min and discovered  $42 \pm 20$  recipes, of which  $10 \pm 7$  based on pulses. IAT reaction times showed a significantly better association of pulses with complexity than with simplicity in the beginning of the study ( $T = -3.28$ ,  $p = 0.0094$ ). In average, this association did not vary after the intervention ( $T = -0.694$ ,  $p = 0.506$ ), however, we observed that time spent playing the game was positively correlated with a better perception of pulses at the end of the intervention ( $p = 0.017$ ,  $R^2 = 0.57$ ). A serious game of recipe construction can be a way to change perception of novel ingredients, provided that it allows a sufficient exposure time.

#### **(5) Social disparities in food preparation behaviours: a DEDIPAC study**

Caroline Méjean, Wendy Si Hassen, Aurélie Lampuré, Séverine Gojard, Pauline Ducrot, Sandrine Péneau, Serge Hercberg, Katia Castetbon; *France* (Université Paris 13, INRA)

Socioeconomic disparities for food preparation behaviours have rarely been explored although they might influence diet quality. This study investigated whether socio-economic position is associated with food preparation behaviours. A total of 62,373 adults participating in the web-based NutriNet-Santé cohort study were included in our cross-sectional analyses. Cooking skills, preparation from scratch and kitchen equipment were assessed using a 0-10-point score and, frequency of meal preparation, enjoyment of cooking and willingness to cook better or more frequently were categorical variables. Associations between socioeconomic position and food preparation behaviours were assessed using analysis of covariance and logistic regression models stratified by sex and adjusted for age, household composition and for the fact of being or not the main cook in the household. Participants with the lowest education level, those within the lowest income group and female manual and office workers spent more time daily preparing food than participants with the highest education, those with the highest income and managerial staff ( $P < 0.0001$ ). Lowest educated individuals were more likely to be non-cooks than those with the highest education level (Women: OR=3.36 (1.69;6.69); Men: OR=1.83 (1.07;3.16)) while female manual and office workers and never-employed were less likely to be non-cooks (OR=0.52 (0.28;0.97); OR=0.30 (0.11;0.77)). Female manual and office workers had lower score of preparation from scratch and were less likely to want to cook more frequently than managerial staff individuals ( $P < 0.001$  and  $P < 0.001$ ). Women belonging to the lowest income group had a lower score of kitchen equipment ( $P < 0.0001$ ) and were less likely to enjoy cooking meal daily (OR=0.68 (0.45;0.86)) than those with the highest income. Lowest socio-economic groups, particularly women, spend more time preparing food and do not want to cook more frequently than high socioeconomic groups. In spite of unfavourable context in France with reduced time spent preparing meals over last decades, our findings do not show large socioeconomic disparities in food preparation behaviours.

## **(6) A realist evaluation of cooking skills courses in Scotland**

Kim Newstead, Jacqui McDowell; *Scotland* (NHS Health Scotland)

A realist evaluation aims to find out ‘what works, for whom, why and in what context’ by focusing on and explaining the relationship between the context in which the intervention (a cooking course) is applied and the mechanisms by which it works (how participants respond) and the outcomes which are produced. The aim of this evaluation is to find out: Do cooking courses achieve positive outcomes for participants that are vulnerable or/ and are parents managing on low-incomes? What contexts and mechanisms within community cooking courses help achieve or improve the outcomes for participants? The evaluation also involves building the self-evaluation skills of eight partner organisations responsible for the delivering cooking courses that will be evaluated. The evaluation is being completed in two stages: a realist review of grey literature (course self-evaluation materials and lesson plans) was completed in 2015. This concluded that cooking courses seem to successfully attract people who are managing on a low-income or /and who are vulnerable, and programme activities are informed by evidence-based theories on behaviour change (e.g. theories on tailoring, targeting or ‘relevance’). However, as the grey literature was not robust, conclusions about the impact of cooking courses could not be made. The second stage builds on the review by gathering robust evidence from multiple courses (32), (each partner will submit evidence from four courses), measuring against a collective set of outcomes and indicators. It also aims to refine theories on specific programme activities or strategies and the mechanisms that trigger outcomes (or not). Self-evaluation data is being analysed by Kim Newstead, with 10% checked by Jacqui McDowell for consistency. Staff from the partner organisations will contribute to refining theories. The realist evaluation is ongoing. Initial analysis shows strategies that aim to ensure ‘relevance’ by tailoring programme activities and messages to individual participants may be more important for some participants than others.

## **(7) Challenges and Opportunities for Integrating Cooking Experiences into U.S. Nutrition Education Programs for Low-Income Children and Youth**

Leslie Cunningham-Sabo, Susan Baker, Brigid McDonnell, Jessica Clifford, Barbara Lohse, Stephanie Smith; *USA* (Colorado State University)

Despite growing evidence that children’s involvement in cooking improves their dietary choices and other health outcomes, the extent U.S. in-school nutrition education curricula include cooking activities is unclear. Objectives: 1) Examine the most widely-used 3rd–5th grade Expanded Food and Nutrition Education Program and Supplemental Nutrition Assistance Program Education (EFNEP/SNAP-Ed) curricula for evidence and extent of cooking activities and related concepts; 2) identify barriers and supports for cooking inclusion from EFNEP/SNAP-Ed program leaders; and 3) determine their preferred content for cooking-inclusive curricula. Most frequently used curricula underwent independent in-depth review of nutrition, food safety, food resource management and cooking/food preparation content by 2 trained reviewers. Individual lessons were scored on content frequency and level of instruction provided. EFNEP/SNAP-Ed program leaders from throughout the U.S. were surveyed to assess their experiences with youth curricula, value of and barriers to including cooking activities in

youth programming, and interest in new curricula. Review of the most commonly used curricula (n=6) revealed few cooking and safe food handling experiences. All curricula included food group-based lessons; lesson length ranged from 30 minutes to greater than 2 hours. Fifty-four survey responders (72% response rate) indicated a preference for a 6-8 experiential lesson series that addresses national evaluation objectives, grade-specific academic standards, and incorporates cooking and food tasting activities. These program leaders support food activities that comply with school food guidelines and can accommodate limited classroom time and resources. Nutrition education curricula that include cooking and food tasting lessons, address academic standards, and account for limited time and resources will fill a curricula gap for low-income children and youth in the U.S.

#### **(8) Culinary intervention in an elderly population to improve the sensory perception in acid fruit**

Luisa Solano, MR Teruel, C Cuadrado, B Beltrán; *Spain* (Universidad Complutense de Madrid)

Taste and smell make food enjoyable and can influence on food preferences. Investigations suggest that age has negative effect on salty and sweet taste perception, but not on acid and bitter taste, so elderly can enjoy strongly of taste like acid and bitter. Determinate the grade of preference of these tastes could be improving enjoyment and the overall acceptance of nutritionally beneficial foods. The aim of this research is to evaluate the use of an Extra Virgin Olive Oil & Essential Oils from flowers, plants and fruits to modify the sensory grade of sour on kiwi. A sensorial test was carried out in 36 nursing home residents (82,3y). There were two treatment groups: Control (kiwi 20g) and EVOO & EO (kiwi with EVOO 20g/0.2ml). Sensorial analyses were conducted in a room enabled to this purpose. Kiwis were cut in two pieces of approximately 4x4x1 cm (one per treatment), codified with three-digit number and immediately presented to consumers. Sensory test contained different parts: Just about right scale, open and close questions and ranking. Overall sensory scores were high in both treatments, Control (6.5) and (7.2), although no significant differences were observed between treatments EVOO&EO samples were better evaluated. Consumers showed similar preference for both samples and most of them (83-86%) would consumer it again. Consumers (71%) could not detect different aromas to the kiwi one. Related to JAR scale, the differences found in the sour attribute are remarkable. The 32% of consumers considered that control sample was much sour than usual, while, the 42% of consumers defined the sample with EVOO&EO as not enough sour. The doses used of EVOO&EO decreased the sour of kiwi, without modifying the specific organoleptic characteristics of the fruit. However, the decrease was considered excessive by around 40% of the consumers. It will therefore be important to investigated different doses for future research.

#### **(9) Cooking trends and globalization: Dynamics as perceived by culinary art students in 5 countries**

Maxime Michaud; *France* (Institut Paul Bocuse)

Cooking has always been an integral part of cultures, and cooking habits now more than ever are rapidly evolved, incorporating foreign influences (e.g. recipes, appliances, technics, ingredients) through several means (e.g. internet, TV, travel, shops, restaurant, information

campaigns) worldwide. Given the various factors that could impact the perception of cooking, further research to identify the most influential is needed. The aim of this study was to examine how cooking experts from 5 countries perceive the dynamics and the extent of the influence of those factors and global trends (e.g. health, environment) in the cooking habits of them and their relatives. Twelve long semi-structured interviews of under-graduate culinary art students from France, Mexico, USA, South Africa and Korea were performed during June and July 2016 by anthropologists at the Institut Paul Bocuse Research Centre. The interviews have been analysed with the help of a QDA Software. Although cooking habits are effectively modified by foreign influences and global modernity, it appears that local cultural patterns are not eliminated but determine the way these influences are integrated. The young generation is still attached to its cultural roots, including food and cooking habits. However, there was a trend of individualization of cooking habits, demonstrated by personal choices regarding food, linked to health, well-being and environment (e.g. vegan food, gluten-free, lactose-free, organic food). Paradoxically, these behaviors presented as “individual” seems to be the most shared trend in the different countries.

**(10) Effect of changing portion sizes on vegetable and meat consumption, waste and meal satisfaction**

Nicole Neufingerl, Erik van Bommel, Ria van der Maas; *The Netherlands* (Unilever R&D Vlaardingen)

Consumer research shows that diners want healthier meals when eating out and care about sustainable practices of restaurants. Increasing the amount of vegetables while decreasing the amount of meat/fish of a dish, could make restaurant meals healthier and reduce their environmental impact. Yet, there are concerns that this may negatively affect meal satisfaction and increase food waste. Therefore, the objective of this study was to investigate the effect of changing portion sizes of vegetables and meat/fish in restaurant meals on intake, waste and meal satisfaction. The study was conducted in a typical Dutch restaurant. For a selection of nine main-dishes, the standard amount of vegetables served was increased from 117g in the control period to 150g during the intervention period. The amount of meat/fish served differed per dish (range 143-177g) and was generally reduced by 15%, resulting in portions of 122-150g. Furthermore, vegetables and meat/fish were presented as an integrated dish rather than separate components. Food intake and waste was measured by weighing the remainders of the dish components and subtraction from the standardized amount served. Meal satisfaction was evaluated with a questionnaire using 5-point likert scales. The intervention period is currently still ongoing. Preliminary results are based on consumption data of 149 diners, collected during the control period, of whom 118 also answered the questionnaire. Mean vegetable and meat/fish consumption was 102g and 139g, with 56% and 54% of diners, respectively, finishing the portions. On average, 13.0% ( $\pm 22.1\%$ ) of vegetables and 9.1% ( $\pm 13.7\%$ ) of meat/fish served was wasted. Of the diners, 26% considered the amount of vegetables served as (too) little, 12.7% indicated the amount of meat/fish served as a lot or too much. As the frequency of out of home consumption increases, small healthy changes to restaurant meals may have a large public health impact.



### **(11) The culinary act in everyday life: definition and pilot study**

Sarah Bastien, Clémentine Hugol-Gential, Jean-Jacques Boutaud ; *France* (Université de Bourgogne)

Cooking at home, according to studies, newspapers and social networks, has become increasingly popular. This is in opposition with the reduction of time spent in culinary preparation. While health discourses advocate consumer responsibility and invite them to consume a more balanced diet, we question the place of cooking in everyday life in France. The culinary act is a cycle of actions that leads to the realization of the desired dish. It is an integral part of the food act. A cycle starts either when you find an idea or a recipe, or when selecting the ingredients. These actions are followed by the realization of the recipe, by technical means, and by conceptual and perceptual skills. Subsequently, the preparation will be served or preserved. By following the steps of the culinary cycle, we have elaborated a first investigation that concerns the determination of the culinary organization of the week. The criteria chosen are to answer to what Ascher calls the creative class, it is composed of individuals who will be more able to modify their culinary practices and to have a reflection on their culinary act. To ensure this criterion, we ask during the recruitment stage, questions such as : how many convenience food are you consuming per week ? On two distinct seasons, we will observe the construction of a shopping list, whether automatic or deliberate. Then, by using think aloud technique, individuals will verbalize the reasons of their choice and culinary projections with the selected products. Following studies of observing shoppers choices, a food diary will be given to the participants in order to know what they had cooked with the food purchased during the shopping observation phase. Just after the return of food diary, interviews will be carried out to clarify the elements of culinary act. These protocols aim at capturing the different definitions of culinary act according to the individual investigated.

### **(12) Teaching Food Agency through inquiry and action**

Amy Trubek, Jacob Lahne, Caitlin Morgan, Julia Wolfson, Shauna Henley, Stephanie Bostic, Jean Harvey, Joanne Curran-Celentano, Cynthia Belliveau; *USA* (University of Vermont)

What is the goal of teaching people how to cook? To impart specific nutritional messages, or to enable people to set and achieve food-preparation goals or to reproduce certain cultural practices and beliefs? We are developing a cooking pedagogy to enhance individual “food agency” (in review). To possess food agency is to be empowered to act throughout the planning and preparation of meals, within a particular food environment. We seek to understand which components of instruction facilitate students becoming effective home cooks. As part of a required nutrition course, undergraduate students participate in a semester of weekly, three-hour-long cooking classes. Pedagogical tools, inspired by culinary school practices and theories of experiential education, have been refined over 10 years for maximum impact on student skill and self-efficacy in the kitchen. Primary methods of refinement are instructor observations, on-going revisions in form, structure and content and student feedback. We have also conducted qualitative longitudinal studies on the program’s lasting effects. Students respond to the hands-on, self-directed structure of the class, and take on more responsibility for their cooking development as the semester progresses. Students who live off-campus, and are responsible for their own meals, demonstrate more interest and are more likely to report that the content is relevant to their lives, suggesting that life course is an

important part of the pedagogy's success. We propose a full-cycle approach (i.e. from provisioning to preparing food) and inquiry-based pedagogy, aimed at empowering rather than simply instructing. Specific components of this pedagogy include repetition, recipe analysis, mise en place organizational skills, troubleshooting, and sensory evaluation of final product. We plan to expand the implementation of this pedagogy to a non-academic setting to test its efficacy in different contexts.

**(13) Art on a plate: effects of an international initiative with chefs on children's liking and eating**

Klazine van der Horst, Elena Urdaneta, Xavier Alliot; *Switzerland* (Nestlé Research Center)

Enhancing visual appeal of foods has been suggested as a strategy for promoting healthy foods consumption in childhood. Other studies showed that involving children in meal preparation can increase their vegetable intake and enhance their eating habits. The objective of this evaluation study was to assess the effect of an "art on a plate" event on the willingness to taste and liking of foods, especially vegetables in children on a global scale. 480 children (mean age =  $8.5 \pm 1.7$ y) from 16 countries participated in a single cooking workshop with Chefs, consisting in creating an attractive design with the necessary ingredients for preparing a Spinach and Fruit Salad. The same questionnaire was answered by the children before and after the workshop containing the following items: Willingness to taste and Willingness to eat entirely a Spinach and Fruit salad; Prospective liking of a Spinach and Fruit salad; Emotions / feelings of the child: valance (pleasure), arousal, control. At the end of the workshop, the children were invited to eat the salad they created. Individual intakes were assessed. Amongst the 76 children who answered NO at baseline, 73% (CI95% = 0.61 – 0.82) changed from NO to YES their answer for willingness to taste between before and after the workshop. Mean prospective liking of a Spinach and Fruit salad has been found significantly higher after the workshop compared to baseline ( $P = 0.0073$ ). Mean Control score has been found significantly higher after the workshop compared to baseline ( $P = 0.0036$ ). 84% of the children tasted or ate entirely the spinach at the end of the workshop. We found that a single "Art on a Plate" cooking workshop with a particular vegetable, organized in a wide range of countries, could help in increasing the willingness to taste a plate containing this vegetable in children. We also demonstrated other positive effects, such as an increase in the liking for this particular vegetable and an increase in the control emotional dimension. This is a first indication that the beneficial effect of creative involvement of children in meal preparation exists across countries.

# *What should be the future of cooking research?*

## Round Table with:



### Martin Caraher (UK)

Martin Caraher is professor of food and health policy at the Centre for Food Policy at City University London. He has worked on issues related to food poverty, cooking skills, local sustainable food supplies, the role of markets and co-ops in promoting health, farmers markets, food deserts & food access, retail concentration and globalisation. His current research interests include: the planning process nationwide in promoting food projects and promoting access to healthy foods; cooking skills among young people and the changing nature of food skills and the culinary transition; the role of cooking projects and celebrity chefs in helping change/hinder dietary habits. He has published extensively on cooking and celebrity culture and is working with colleagues on an all-Ireland review of cooking habits.



### Julia Wolfson (USA)

Julia Wolfson is an Assistant Professor in the Department of Health Management and Policy at the University of Michigan. She is a mixed-methods health policy researcher whose work focuses on health and social policies related to food and beverage choices, diet quality, and obesity. She is particularly interested in the role of cooking for healthy eating, school and community cooking and nutrition education, and school and community food environments. Current research focuses on the measurement and definition of cooking skills and behaviour, implementation of cooking skills education, and changes to the restaurant environment related to menu labelling regulations. After a career as a professional chef in fine dining restaurants, Dr. Wolfson earned her Master's of Public Policy from the University of Southern California (2012) and PhD in health policy from Johns Hopkins University Bloomberg School of Public Health (2016).



### Ana Isabel de Almeida Costa (Portugal)

Ana Costa is Senior Researcher and Invited Assistant Professor at the Católica-Lisbon School of Business & Economics of *Universidade Católica Portuguesa* (CLSBE-UCP). She holds a PhD in Nutrition, Food Technology & Biotechnology from Wageningen University (The Netherlands). Her research focus on how people weigh external against internal information when making food consumption decisions. Namely, she studies how contextual cues (product features, assortment, store layout, point-of-purchase information) and social influences (norms, cultural values, word-of-mouth) may constrain the effects of consumers' prior knowledge (i.e., their beliefs, attitudes and preferences), as well as of their own goals and plans, on behaviour.



### Leslie Cunningham-Sabo (USA)

Leslie Cunningham-Sabo has led school- and community-based nutrition intervention research projects for more than 20 years, using a community-based participatory research approach. She has spent considerable time working effectively with diverse populations in both rural and urban school districts and communities to design, implement, and evaluate nutrition and physical activity programs for both children and adults. A recent focus has been to determine the impact of experiential cooking interventions on children's fruit and vegetable preferences, and cooking attitudes and self-efficacy. A recent project employed principles of behavioural economics in middle school cafeterias to improve students' selection of vegetables offered at lunch. Currently she serves as Project Director for a childhood obesity prevention project called "Fuel for Fun: Cooking with Kids plus Parents and Play".



### Klazine van der Horst (Switzerland)

Klazine van der Horst joined the Nestlé Research Center in September 2011 and she conducted various studies in children's eating behaviours. Currently, she is involved in a global research project on dietary intake and eating behaviours in infants and children as a senior nutrition scientist and she is program manager for the research program on sustainable nutrition. From 2008 to 2011 she has worked as a Postdoctoral scientist at the Swiss Federal Institute of Technology in Zurich where she was responsible for setting up a longitudinal panel to study food intake and eating behaviours in Swiss adults and she did study the influence of cooking and cooking skills on eating behaviours. Klazine holds a Doctorate in Public Health and a Master specialization in Health Education & Health Promotion.

## Conclusion

The second edition of the **COOK & Health Scientific Symposium** at University West London joined more than forty professionals from academia, public sector, food industry and gastronomy sector. Twelve nationalities were represented as well as various academic disciplines: public health, psychology, nutrition, sociology, anthropology, education sciences, etc...

The importance of working on the definition of cooking and cooking skills across the life course has been highlighted: what kind of cooking related measure do we need, to be health relevant at different life stages: technical cooking skills, confidence, involvement, shopping, managing food budgets, nutrition knowledge?

One main challenge for the future is to promote cooking and healthy eating among the society by creating new strategies and new tools including technological ones, by introducing cooking in public policies 'agenda and by helping people in overcoming barriers to cooking, such as time or economic constraints, food accessibility and food related skills.



## List of participants





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